

AMENDMENTS TO THE CLAIMS

Claims 1-34 (Cancelled)

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35. (Currently Amended) A method of producing a substrate material of an aluminum/silicon carbide composite alloy by the sintering method, wherein the method comprises steps of:

mixing an aluminum powder and silicon carbide powder to form an aluminum/silicon carbide starting powder mixed homogeneously;
compacting the aluminum/silicon carbide starting powder having a silicon carbide content of from 10 to 70% by weight to form a compact; and
and sintering the compact at a temperature of from 600°C to 900°C or higher in a non-oxidizing atmosphere to thereby obtain an aluminum/silicon carbide composite alloy.

36. (Currently Amended) The method of producing a substrate material as claimed in claim 35, wherein the sintering step is conducted at the temperature within a range of from 600°C to 750°C.

37. (Original) The method of producing a substrate material as claimed in claim 35, wherein the sintering step is conducted in a nitrogen atmosphere having a nitrogen concentration of 99% by volume or higher.

38. (Original) The method of producing a substrate material as claimed in claim 35, wherein the sintering step is conducted in an atmosphere having an oxygen concentration of 200 ppm or lower.

39. (Original) The method of producing a substrate material as claimed in claim 35, wherein the sintering step is conducted in an atmosphere having a dew point of -20°C or lower.

40. (Original) A method of producing a substrate for mounting a semiconductor chip as claimed in claim 35, further comprising the step of repressing the aluminum/silicon carbide composite alloy obtained by sintering the aluminum/ silicon carbide starting powder, or repressing them and then heating in a non-oxidizing atmosphere so as to prevent from oxidizing aluminum.

41. (Previously Presented) A method of producing a substrate made of an aluminum/silicon carbide composite alloy by the sintering method, comprising the steps of:
mixing an aluminum powder and silicon carbide powder to form an aluminum/silicon carbide starting powder having a silicon carbide content of from 10 to 70% by weight;
compacting the aluminum/silicon carbide starting powder to form a compact;

D1

sintering the compact at a temperature of 600°C or higher in a non-oxidizing atmosphere for aluminum to thereby obtain a pre-formed substrate made of an aluminum/silicon carbide composite alloy; and

forming a coating layer on a surface of the pre-formed substrate to thereby obtain the substrate.

42. (Original) The method of producing a substrate as claimed in claim 41, wherein the step of forming a coating layer is:

heating the substrate in an oxidizing atmosphere; or

exposing the substrate to a steam atmosphere.

43. (Original) The method of producing a substrate as claimed in claim 41, wherein the step of forming a coating layer comprises steps of:

forming a layer of a metal having a Young's modulus of 15,000 kg/mm² or lower on the substrate material;

polishing the metal layer;

and plating the polished metal layer with at least one metal selected from nickel and gold.

44. (Original) The method of producing a substrate as claimed in claim 41, wherein the step of forming a coating layer comprises steps of:

forming a layer of a metal having a melting point of 600°C or lower on the substrate surface;

heating the metal layer to a temperature not higher than 600°C; and
plating the metal layer with at least one metal selected from nickel and gold.

45. (Original) The method of producing a substrate as claimed in claim 41, wherein the step of forming a coating layer comprises steps of:

forming a layer of at least one organic resin selected from an epoxy resin, a silicone resin, a polyimide resin, and the like each containing a metallic filler or not on the substrate surface.

46. (Original) The method of producing a substrate as claimed in claim 45, wherein the step of forming a coating layer further comprises steps of:

plating a metal layer made of at least one metal selected from nickel and gold on the layer of organic resin.

47. (Original) The method of producing a substrate as claimed in claim 46, wherein the forming step of a layer of a metal having a Young's modulus of 15,000 kg/mm² or lower on the substrate is conducted by barrel plating.

48. (Original) The method of producing a substrate as claimed in claim 47, wherein the barrel plating is conducted in a container which contains metal spheres having a particle diameter of from 0.1 to 10 mm and having the same composition as the deposit to be formed.

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49. (Original) The method of producing a substrate as claimed in claim 48, wherein the spheres contained in the container for use in barrel plating have a surface area which is at least two times that of the corresponding true spheres.

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